

tempo set by the tempo control keys 22 and 24, the BGM volume set by the volume control keys 26 and 28, the music number and pitch set by the music selection/pitch control keys 30 and 32, the echo mode set by the echo mode selection key 34, and the voice effect mode set by the voice effect mode selection key 36. The cancellation key 38 is also used to stop a music being played.

A decision key 39 is provided below the music selection/pitch control keys 30 and 32. The decision key 39 is a key for deciding and enabling the tempo set by the tempo control keys 22 and 24, the BGM volume set by the volume control keys 26 and 28, the music number and the pitch set by the music selection/pitch control keys 30 and 32, and the voice effect mode set by the voice effect mode selection key 36.

An AV cord 40 is withdrawn from a lower portion of the housing 12, i.e. from a lower end of the cylindrical portion, and the AV cord 40 includes two audio output terminals 42L and 42 R and one video output terminal 44. The audio output terminals 42L and 42R and the video output terminal 44 are connected to an AV terminal of a television monitor (not shown). Therefore, images or videos and voices of the karaoke device with built-in microphone 10 in this embodiment are outputted on the television monitor.

A cartridge connector 46 is provided on a rear surface of the housing 12 as shown in Figure 1(B), and a memory cartridge 48 is removably attached to the cartridge connector 46. In addition, the karaoke device with built-in microphone 10 in this embodiment is driven by batteries, and therefore, a battery box 50 is provided at the lower cylindrical portion of the housing 12 as shown in Figure 1(B).

Referring to Figure 2, the karaoke device with built-in microphone 10 in this embodiment includes a processor 52 accommodated inside the housing 12. An arbitrary kind of processor can be utilized as the processor 52; however, in this embodiment a

high-speed processor (trademark "XaviX") developed by the assignee of the present invention and already filed as a patent application is used. This high-speed processor is disclosed in detail in Japanese Patent Laying-open No. 10-307790 [G06F 13/36, 15/78] and US Patent Application No. 09/019,277 corresponding thereto.

5 Although not shown, the processor 52 includes various processors such as a CPU, a graphic processor, a sound processor, a DMA processor and etc., and also includes an A/D converter used in fetching an analog signal and an input/output control circuit receiving an input signal such as a key operation signal and an infrared signal and giving an output signal to external devices. The CPU executes required arithmetic and logical
10 operations in response to the input signals, and gives results to the graphics processor, the sound processor and etc. Therefore, the graphic processor and the sound processor execute image processing and audio processing according to the operation results.

 A system bus 54 is connected to the processor 52, and an internal ROM 56 mounted on a circuit board (not shown) which is accommodated within the housing 12
15 together with the processor 52 and an external ROM 58 included in the memory cartridge 48 are connected to the system bus 54. Therefore, the processor 52 can access to the ROMs 56 and 58 through the system bus 54, and can retrieve video or image data and music data (score data for playing musical instruments) and so on.

 As shown in Figure 2, an audio or sound signal from the microphone 14 is applied
20 to an analog input of the processor 52 through an amplifier 60. An analog audio signal which is a result of the processing by the sound processor portion of the processor 52 is outputted to the audio output terminals 42 (42L, 42R) shown in Figure 1 through a mixer 62 and an amplifier 66. Furthermore, an analog image or video signal which is a result of the processing by the graphic processor (not shown) of the processor 52 is outputted to
25 the video output terminal 44 shown in Figure 1. In addition, display data is applied from

an output port of the processor 52 to the display 20 shown in Figure 1, and all switches and keys shown in Figure 1 (herein shown generally by reference numeral 21) are connected to an input port of the processor 52.

Referring to Figure 3, a description is made on a stored state of programs and data in the internal ROM 56 and the memory cartridge ROM 58. The ROM 56 is stored with a warning message display program 56a, karaoke video data 56b, and karaoke music data 56c. The warning message display program 56a is started when the power switch 16 is turned on in a state that the memory cartridge 48 is not attached or inserted, whereby a warning message is displayed on the television monitor. The karaoke video data 56b and the karaoke music data 56c are data commonly used for any musics stored in the memory cartridge 48. The karaoke video data 56b includes title screen data, basic background screen data, frame and icon data, and font data. The karaoke music data 56c includes basic music source data.

The memory cartridge ROM 58 is stored with a karaoke program 58a, karaoke video data 58b, and karaoke music data 58c. When the power switch 16 is turned on in a state that the memory cartridge 48 is attached to the karaoke device with built-in microphone 10, the karaoke program 58a is started, and processing such as system initialization, sequence control, video display control, A/D conversion and music processing, music reproduction control, and etc. is executed. The karaoke video data 58b includes music selection screen data and additional background screen data. The karaoke music data 58c includes music script data (lyric data) and additional music source data. Both of karaoke video data 58b and karaoke music data 58c are used for processing of the karaoke program 58a.

A configuration of the cartridge connector 46 and the memory cartridge 48 is shown in Figures 4 and 5. The memory cartridge 48 has a printed circuit board